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10/821,913

04/12/2004

Hideki Sato

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32172

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09/05/2008

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EXAMINER

SCHINDLER, DAVID M

ART UNIT

PAPER NUMBER

2862

MAIL DATE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/821,913	<b>Applicant(s)</b> SATO ET AL.	
	<b>Examiner</b> DAVID M. SCHINDLER	<b>Art Unit</b> 2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2-8, 17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-8, 17 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 10/052,525.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/16/08; 6/19/08</u> .  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

1. This action is in response to the communication filed 5/12/2008.

***Response to Amendment***

2. In response to applicant's amendments, the claim objections of claims 4 and 7 are withdrawn.

***Response to Arguments***

3. Applicant's arguments filed 5/12/2008 have been fully considered but they are not persuasive.

4. With regard to applicant's arguments directed toward claim 7, the Examiner respectfully disagrees with applicant.

Applicant states that in order to construct a sensor as required in claim 7, the elements must be connected together (see the arguments in the last paragraph on page 2 of the remarks). The Examiner notes that firstly, the identified elements as noted in the rejection below are all connected together by way of the substrate on which they are located. Furthermore, it appears that applicant is arguing that in order to construct an X-axis or Y-axis group sensor, all of the elements in each respective group must be electrically connected to each other. The Examiner notes that this is not claimed. The term construct is defined to mean "To form by assembling or combining parts" per the American Heritage Dictionary. The Examiner notes that all

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of the elements depicted in Figure 10 are located on a single substrate (note Figure 10, note Page 13, Lines 10-17, and note Page 16, Lines 1-3). Therefore, all of the elements are combined by way of the substrate. Therefore, the Examiner respectfully disagrees.

5. With regard to applicant's statement regarding the Terminal Disclaimer in view of US Patent 7,187,167, please note the response below.

6. The double patenting rejection in view of US application 11/682,841 is withdrawn in view of applicant's arguments.

***Terminal Disclaimer***

7. The terminal disclaimer filed on 5/12/2008 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 7,187,167 has been reviewed and is NOT accepted.

a. The person who signed the terminal disclaimer is not recognized as an officer of the assignee, and he/she has not been established as being authorized to act on behalf of the assignee. See MPEP § 324.

8. An attorney or agent, not of record, is not authorized to sign a terminal disclaimer in the capacity as an attorney or agent acting in a representative capacity as provided by 37 CFR 1.34 (a). See 37 CFR 1.321(b) and/or (c).

9. It would be acceptable for a person, other than a recognized officer, to sign a terminal disclaimer, provided the record for the application includes a statement that the person is empowered to sign terminal disclaimers and/or act on behalf of the organization.

Accordingly, a new terminal disclaimer which includes the above empowerment statement will be considered to be signed by an appropriate official of the assignee. A separately filed paper referencing the previously filed terminal disclaimer and containing a proper empowerment statement would also be acceptable.

10. Furthermore, it does not appear that the terminal disclaimer fee has been paid. Applicant submitted a fee on 5/12/2008 which was for a "Request for voluntary publication or rep" (see applicant's submitted electronic patent application fee transmittal for 5/12/2008). However, no Terminal Disclaimer fee appears to have been submitted.

11. For the above reasons, the Terminal Disclaimer submitted 5/12/2008 has not been accepted.

***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

13. Claims 7 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by ADELERHOF et al. (ADELERHOF) (WO 00/79298).

14. As to Claim 7,

15. ADELERHOF discloses a plurality of magnetoresistance effect elements (Figure 10), each element including a spin valve film, the film including a free layer, a spacer layer and a pinned layer having a pinned magnetization direction, the element having a resistance value that changes in accordance with a relative angle formed by a magnetization direction of the pinned layer and a magnetization direction of the free layer, wherein (a) the layers of each of the magnetoresistance effect elements are successively laminated directly on a single substrate of a single chip, (b) an X-axis group (the two left most and the two right most elements) of four of a plurality of the magnetoresistance effect elements constructs an X-axis magnetic sensor for detecting a magnetic field in an X-axis direction, and all of the magnetoresistance effect elements of the X-axis group have pinned magnetization directions of the pinned layers parallel to each other, and (c) a Y-axis group (the four top

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elements) of four of a plurality of magnetoresistance effect elements constructs a Y-axis magnetic sensor for detecting a magnetic field in a Y-axis direction perpendicular to the X-axis direction and all of the magnetoresistance effect elements of the Y-axis group have pinned magnetization directions of the pinned layers parallel to each other ((Figure 10) and (Page 1, Lines 9-29) and (Page 2, Lines 1-8) and (note applicant's specification, page 1, lines 20-28) and (Page 5, Lines 23-29) and (Page 13, Lines 10-17) and (Page 17, Lines 20-22)).

16. As to Claim 17,

17. ADELERHOF discloses the X-axis group of four of a plurality of the magnetoresistance effect elements constructs the single X-axis magnetic sensor by wiring formed directly on the single substrate, and wherein the Y-axis group of four of a plurality of the magnetoresistance effect elements constructs the single Y-axis magnetic sensor by a wiring formed directly on the single substrate ((Figure 10) and (Page 13, Lines 10-17) and (Page 16, Lines 1-3)).

### ***Double Patenting***

18. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not

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identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

19. Claims 2-8, 17, and 18 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 4, 7, 8, and 11 of U.S. Patent No. 7,187,167 ('167). Although the conflicting claims are not identical, they are not patentably distinct from each other because:

20. As to Claim 2,

21. '167 discloses a magnetoresistance effect element including a spin valve film, the film including a free layer, a spacer layer (pinning layer) and a pinned layer whose magnetization direction is pinned, wherein the layers are successively laminated on a substrate of a single chip, the substrate having



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a rectangular shape which has two sides along an X-axis and perpendicular to the Y-axis direction and the other of the center lines is a center line of the two sides along the Y-axis and perpendicular to the X-axis, and the pinned layers of at least two of the plurality of magnetoresistance effect elements have the pinned magnetization directions that cross each other (Claim 4).

22. As to Claim 3,

23. '167 discloses a single axis magnetic sensor by full bridge connection of the four elements, the single axis magnetic sensor being an X-axis magnetic sensor for detecting a magnetic field along the X-axis or a Y-axis magnetic sensor for detecting a magnetic field along the Y-axis, the pinned magnetization directions of the pinned layers of the four elements being parallel to each other (Claim 7).

24. As to Claim 4,

25. '167 discloses eight magnetoresistance effect elements including a first through an eighth element, each of the elements including a spin valve film, the film including a free layer, a spacer layer (pinning layer) and a pinned layer, the pinned layer having a pinned magnetization direction, wherein the layers are successively laminated on a substrate of a single chip, the substrate having a rectangular shape which has a left

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side along a Y-axis, a right side along the Y-axis, a top side along an X-axis and a bottom side along the X-axis in plan view, the X-axis and the Y-axis are perpendicular to each other, and each of the elements has a resistance value that changes in accordance with a relative angle formed by a magnetization direction of the pinned layer and a magnetization direction of the free layer, the magnetic sensor being formed in such a manner that the magnetoresistance effect elements are provided on a single plane, (a) the first element being formed at a position closed to the left side than the right side and below a center line of the left side and the right side, the first center line being perpendicular to the Y-axis, and the first element having a pinned magnetization direction of the first element's pinned layer in a direction of the X-axis, (b) the second element being formed at a position closer to the left side than the right side and above the first center line, the second element having a pinned magnetization direction of the second element's pinned layer in the direction of the X-axis, (c) the third element being formed at a position closer to the right side than the left side and above the first center line, and the third element having a pinned magnetization direction of the third element's pinned layer in the direction of the X-axis, (d) the fourth element being formed at a position closer to the

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right side than the left side and below the first center line, and the fourth element having a pinned magnetization direction of the fourth element's pinned layer in the direction of the X-axis, (e) the fifth element being formed at a position closer to the top side than the bottom side and left of a second center line of the top side and the bottom side, the second center line being perpendicular to the X-axis, and the fifth element having a pinned magnetization direction of the fifth element's pinned layer in the direction of the Y-axis, (f) the sixth element being formed at a position closer to the top side than the bottom side and right of the second center line, and the sixth element having a pinned magnetization direction of the sixth element's pinned layer in the direction of the Y-axis, (g) the seventh element being formed at a position closed to the bottom side than the top side and right of the second center line, and the seventh element having a pinned magnetization direction of the seventh element's pinned layer in the direction of the Y-axis, and (h) the eighth element being formed at a position closer to the bottom side than the top side and left of the second center line, and the eighth element having a pinned magnetization direction of the eighth element's pinned layer in the direction of the Y-axis (claim 8).

26. As to Claim 5,

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27. '167 discloses (a) the first to fourth elements construct an X-axis magnetic sensor for detecting a magnetic field in the direction of the X-axis by full bridge connection of the first to fourth elements, and (b) the fifth to eighth elements construct a Y-axis magnetic sensor for detecting a magnetic field in the direction of the Y-axis by full bridge connection of the fifth to eighth elements (claim 11).

28. As to Claim 6,

29. '167 discloses (a) the pinned magnetization direction of the pinned layer of the first and second elements are in a negative of the X-axis, (b) the pinned magnetization direction of the pinned layer of the third and fourth elements are in a positive direction of the X-axis, (c) the pinned magnetization direction of the pinned layer of the fifth and the sixth elements are in a positive direction of the Y-axis, and (d) the pinned magnetization direction of the pinned layer of the seventh and eighth elements are in a negative direction of the Y-axis (claim 11).

30. As to Claim 7,

31. '167 discloses a plurality of magnetoresistance effect elements, each element including a spin valve film, the film including a free layer, a spacer layer (pinning layer) and a pinned layer having a pinned magnetization direction, the

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element having a resistance value that changes in accordance with a relative angle formed by a magnetization direction of the pinned layer and a magnetization direction of the free layer, wherein (a) the layers of each of the magnetoresistance effect elements are successively laminated directly on a single substrate of a single chip, (b) an X-axis group of four of a plurality of the magnetoresistance effect elements constructs an X-axis magnetic sensor for detecting a magnetic field in an X-axis direction, and all of the magnetoresistance effect elements of the X-axis group have pinned magnetization directions of the pinned layers parallel to each other, and (c) a Y-axis group of four of a plurality of magnetoresistance effect elements constructs a Y-axis magnetic sensor for detecting a magnetic field in a Y-axis direction perpendicular to the X-axis direction and all of the magnetoresistance effect elements of the Y-axis group have pinned magnetization directions of the pinned layers parallel to each other ((Claims 4 and 8).

32. As to Claim 8,

33. '167 discloses (a) the X-axis group of magnetoresistance effect elements construct the X-axis magnetic sensor by full bridge connection, and the pinned magnetization directions of the X-axis group of magnetoresistance effect elements are in the X-axis direction, and (b) the Y-axis group of magnetoresistance

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effect elements construct the Y-axis magnetic sensor by full bridge connection, and the pinned magnetization directions of the Y-axis group of magnetoresistance effect elements are in the Y-axis direction (claim 11).

34. As to Claim 17,

35. '167 discloses the X-axis group of four of a plurality of the magnetoresistance effect elements constructs the single X-axis magnetic sensor by a wiring formed directly on the single substrate, and wherein the Y-axis group of four of a plurality of the magnetoresistance effect elements constructs the single Y-axis magnetic sensor by a wiring formed directly on the single substrate (Claim 11 / note bridge connection).

36. As to Claim 18,

37. '167 discloses the Y-axis sensor is disposed within an area defined by the X-axis sensor (Claim 8).

### ***Conclusion***

38. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened

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statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

39. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID M. SCHINDLER whose telephone number is (571)272-2112. The examiner can normally be reached on Monday-Friday (8:00AM-5:00PM).

40. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Assouad can be reached on (571) 272-2210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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41. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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